Oswego Methods in GEOGRAPHY

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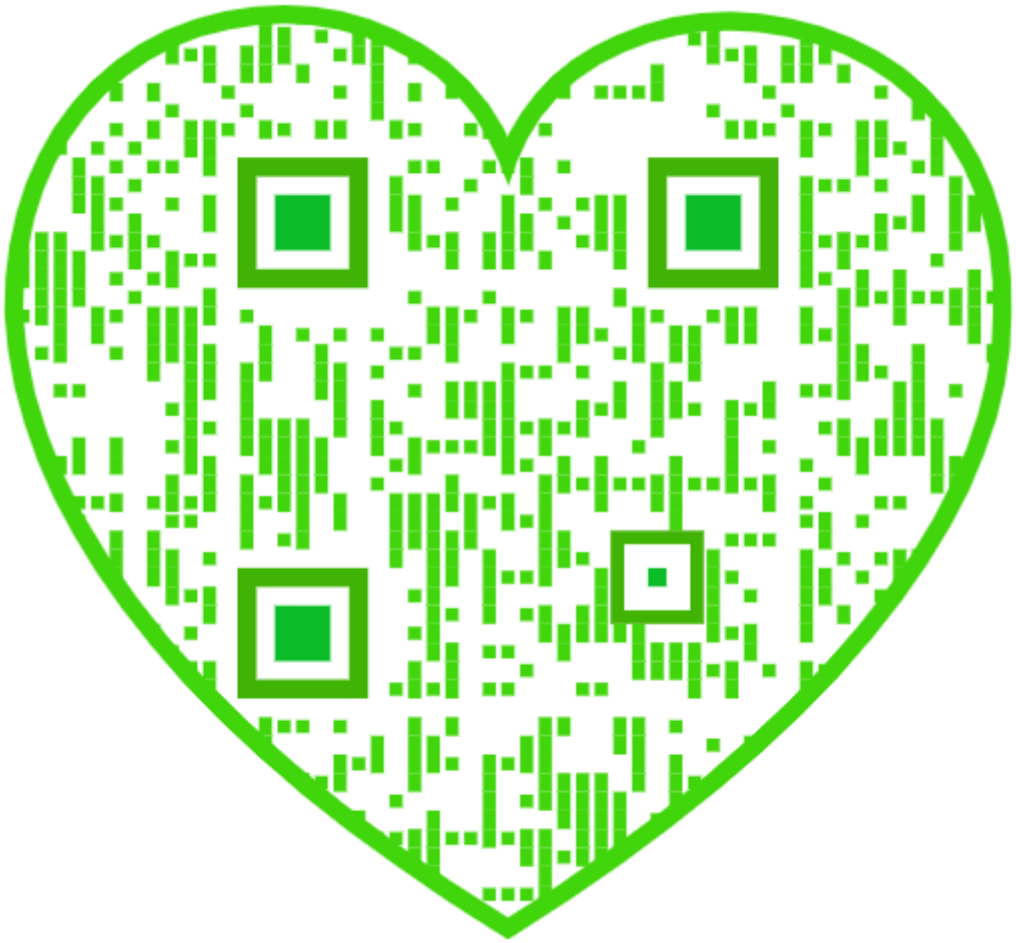

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THE

OSWEGO NORMAL METHOD

—OF—

TEACHING GEOGRAPHY

PREPARED FOR THE PRACTICE DEPARTMENT OF THE
OSWEGO STATE NORMAL AND TRAINING
SCHOOL OF OSWEGO, N. Y.

—BY—

AMOS W. FARNHAM

TEACHER OF GEOGRAPHY METHODS, AND PRINICIPAL OF PRACTICE SCHOOL.

SYRACUSE, N. Y.
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TO THE PRACTICE TEACHER,

the present dependence of the practice school, and the future reputation of the Normal school, these helps on geography teaching are regardfully inscribed by the

AUTHOR.

ACKNOWLEDGMENTS

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Oswego, *May 21, 1896.*

PREFACE

Geography, at best, is a very complex subject. It includes the earth and all that pertains to it, as well as something of its relations to other planets. The subject is practically inexhaustible. It is the study of a lifetime. It begins with the child when he first enters the world, and only ends with him when he takes his exit from it. The question with the teacher is, how much of this study belongs to the life in the school. To what extent is he responsible for giving direction to this study.

It would seem sufficient to demand that he lay good foundations, and get the pupil started in the right direction. If this is a correct premise, then the first duty by the way of laying the foundation is to lead the child to properly observe everything in nature about him,—the air, the water, the sky, the clouds, the temperature, the animals, the plants, the rocks, the soil, the hills, the valleys, the streams, the habitations, the occupations,—in short all that pertains to that part of the earth which he knows, and its environments. He must also become master of the necessary terms with which to express the ideas gained by his observations.

If the teacher leads the child to do this preparatory

work well, he has discharged an important part of his work in teaching geography. The child now knows all of geography that his senses can reveal to him. He has gained the power of accurate observation, inference, and expression. He can readily express his ideas in words, by drawing and painting, by modeling and constructing.

This prepares him for the next step in his progress, and he now steps out from the known to the great unknown. The foundation is laid upon which he is to build. He now goes from the real, the actual, to the imaginative, the ideal. He is no longer confined to that small portion of the earth that lies within the ken of his vision, but he takes in the whole, of which this is but a small part. His knowledge of the depressions and elevations, the smaller water-sheds and water basins, the streams, his village, city or town, and the occupations of the people about him, prepares him to form some conception, vague and inaccurate though it may be, of the great continents, with their vast mountain masses, plateaus, continental water-sheds, basins, and river systems, and their relation to the productions, occupations, and homes of the people.

Thus far the teacher may go with his pupils, and if this is wisely done he has discharged his duty. He has prepared the way for future study,—for the better understanding of all that will need interpretation as

the life study goes on, and for the intelligent filling in of details.

All this evidently was in the thought of the author of this little book, and it seems to me to be admirably presented. It is not designed for memory work. It is full of good suggestions for the teacher; not a guide for him to follow blindly and implicitly, but rather to point out directions in which he may lead his pupils,—outlines of work to be executed in accordance with the conditions and circumstances, the environments and thought or ingenuity of the teacher.

While the author has in mind his pupils in training, at the same time the book is equally suggestive to all teachers of geography, and I predict for it a useful career. The plan, the order of arrangement, the exclusion of unnecessary details, all seem to me very commendable. And I take pleasure in endorsing it as an embodiment of my own idea as to the method of teaching geography. I am proud to recognize among our corps of teachers one who is capable of doing such excellent work in this most difficult subject to teach. His modesty led him to shrink from giving to the public this valuable little treatise designed for a much more restricted use, and the only part I claim in its production and publication is the suggestion and encouragement given to do what he has so skilfully executed.

E. A. SHELDON.

OSWEGO, *May 6, 1896.*

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GEOGRAPHY METHODS

REASONS FOR TEACHING GEOGRAPHY

1. To explain the development of man by imparting knowledge of continental structure and climate, and of their influence upon man, mediate and immediate.

2. To cultivate the imaginative and æsthetic nature.

The study of geography cultivates systematically the imagination, whose products develop emotions of beauty, which, in turn, develop the emotion of grandeur.

The mental picture of the hill or lake which gives beauty to the surrounding landscape, may in time, become the image of the lofty mountain or the expanse of ocean.

3. To explain and illumine history.

History is a record of the deeds of the human race. The civilization and progress of a people depend very largely upon the structure and climate of their country.

4. To develop a broad philanthropy. "To know the world is to love the world."

5. To develop a spirit of investigation. Thus:

a. What has caused Chicago to grow so rapidly?

b. Why is more attention paid to the dairy in Oswego County at present than formerly?

c. Why have the elevators on our river never been rebuilt? Etc.

6. To temper man's judgments with regard to human weaknesses caused by natural environment, e. g.

How should we regard the social conditions of the Eskimos, the Hottentots, and the Fiji Islanders? Etc.

7. To develop man's reverence for human progress.

Study the geography of Holland and the development of agriculture and commerce.

8. To furnish the basis of other sciences: such as ethnology, history, etc.

9. To influence character.

BOOKS OF REFERENCE

Local Geography

Bardeen's Geography of the Empire State, *C. W. Bardeen.*

Physical Geography

Guyot's Physical Geography, *American Book Co.*

Geikie's Primer of Physical Geography, *American Book Co.*

Tarr's Elementary Physical Geography, *Macmillan & Co.*

National Geographic Monographs, *American Book Co.*

Huxley's Physiography, *Macmillan & Co.*

Gee's Short Studies in Nature Knowledge, *Macmillan & Co.*

Astronomical Geography

Jackson's Astronomical Geography, *D. C. Heath & Co.*

The Planet Earth, *D. C. Heath & Co.*

Bowen's Astronomy by Observation, *American Book Co.*

Meteorology

Loomis's Treatise on Meteorology, *Harper & Brothers.*

Davis's Elementary Meteorology, *Ginn & Co.*

Greeley's American Weather, *Dodd, Mead & Co.*

Rasser's Law of Storms, *Norie & Wilson,* London.

Abercrombie's Principles of Forecasting by Means of Weather Charts, *Edwin Stanford,* Charing Cross, London.

Commercial Geography

Chisholm's Handbook of Commercial Geography, *Longmans, Green & Co.*

Keltie's Applied Geography, *Geo. Philip & Sons,* London.

Tilden's Commercial Geography.

Geography Taught by the Traveler

The Boy Traveler Series, *Harper & Brothers.*

The Zigzag Journeys Series, *Estes & Lauriat.*

The Family Flight Series, *D. Lothrop & Co.*

Footprints of Travel, *Ginn & Co.*

Children of the Cold, *Cassell & Co.*

Old Ocean, *Interstate Publishing Co.*

Johonnot's Geographical Reader, *American Book Co.*

Rand-McNally Grammar School Geography.

Frye's Complete Geography, *Ginn & Co.*

General Geography

The World and its People, *Silver, Burdett & Co.*

Picturesque Geographical Readers, *Lee & Shepard.*

Our World Reader, *Ginn & Co.*

Geographical Statistics

Spafford's American Almanac, *American News Co.*

Science of Geography

Guyot's Earth and Man, *Charles Scribner's Sons.*

Ritter's Comparative Geography, *American Book Co.*

Ritter's Geographical Studies, *American Book Co.*

Frye's Child and Nature, *Hyde Park Publishing Co.*

Methods of Teaching Geography

Redway's Manual of Geography, *D. C. Heath & Co.*

McMurry's Special Method in Geography, *Public School Publishing Co.*

Parker's How to Study Geography, *American Book Co.*

Frye's Geography and Sand Modeling, *Ginn & Co.*

King's Methods and Aids in Geography, *Lee & Shepard.*

Geikie's The Teaching of Geography, *Macmillan & Co.*

Brownell's How to Use Globes, *Andrews & Co.*

White's Elements of Pedagogy, *American Book Co.*

Wall Maps of Physical Geography

Guyot's, Kiepert's, Rand-McNally.

C JUNIOR—FOURTH GRADE

GEOGRAPHY--PREPARATORY WORK

I. Position Words

about = on every side of.
above = higher in place.
across = from side to side.
after = behind in place; later in time.
against = in opposition to; facing.
among = mingled with. [Used with regard to more than two parties.]
along = by the length of.
around = on all sides of; from one part to another of.
at = nearer in place.
before = in front of.
behind = on the other side of.
below = not so high.
beneath = in a lower place.
between = in the intermediate space of. [Used with regard to two parties.]
beyond = on the farther side of.
by = not far from.
down = in a descending direction.

in = within limits.
into = from the exterior to the interior.
near = not far from.
off = distant from ; not on.
on = touching the upper surface of a thing and supported by it.
over = from side to side ; above in position and covering.
through = from one surface or limit to the opposite.
to = motion made in the direction of a place, and arrival.
toward = in the direction of.
under = in a lower position and covered.
up = from a lower to a higher plane.
upon = on.
within = in the interior part of.
without = on the outside of.

NOTE.—The use of the above words should be illustrated with objects *in view*.

The ideas of *relation* of *position* should be clearly developed, and expressed in full statements.

Children should be led to state what they mean by the use of *about, above, across,* etc. A sufficient amount of application should follow the development of each idea represented by a position word.

Be thorough. Bear in mind that this is preparatory work for geography.

II. Right, left, front, back

Illustrative questions

1. Which hand am I holding up ? [Right hand.]
2. Show your right hand.
3. What things do you do with your right hand ?
4. Point to your right.
5. Name a pupil at your right, etc., etc., etc.

Similar for left.

1. Where am I standing in regard to you ? [Front.]
2. Where is the table in regard to you ?
3. Trace front edge of table.
4. Place these cubes near the front edge of table, etc., etc., etc.

NOTE.—Lead children to combine terms; e. g., The book is on the *right front* corner of the table. Similar for *left front, right back, left back.*

N. B.—See note below Position Words.

III. The school-room, with terms right, left, front, back, applied.

Ask children to point to right wall, left wall, etc., etc.; to name things *in* or *on* each wall ; to state which walls meet, and which do not meet, etc., etc.

IV. Horizon

1. The sky is above us.
2. The earth is below us,—beneath our feet.
3. The sky seems to rest upon the earth.

4. At the place where the sky seems to touch the earth, a circle seems to be formed.
5. We seem to stand in the center of this circle.
6. We cannot see beyond this circle. We can see only the objects within this circle.
7. We say that this circle bounds our view.
8. We call this circle the horizon.
9. If we change our position the horizon changes.
10. The higher we stand the larger the horizon is. The lower we stand the smaller the horizon is.
11. Above the horizon we can see the sun, moon, and stars. They are called heavenly bodies.
12. For us the sun is the most important of the heavenly bodies.
13. The apparent circle which bounds our view where the sky and earth seem to meet, is called the *horizon*.

NOTE.—Ideas underlying statements of matter on horizon should be gained from actual observation. The horizon should be seen from the highest point accessible to the class. The children of the practice school should observe from the cupola of the Normal building or from Asylum Hill. Children should make drawings of the horizon and of their position with regard to it.

V. Cardinal points

1. Review terms, *right, left, front, back.*

2. Have children change their positions, and state that objects once at their right, are now at their left, or behind them, etc., etc.
3. Develop ideas of necessity for absolute directions, and teach *North, South, East, West.*
4. The North Star and afterward the mariner's compass should be used to illustrate *North.*
5. Teach children how to find the North Star by the aid of the Big Dipper.
6. Correct notions of the points *east* and *west* cannot be gained from the rising and setting of the sun. Why not ?

Semi-cardinal points.

7. Each child should make a drawing of the dial of the mariner's compass representing only cardinal and semi-cardinal points.

VI. Plan of school-room with cardinal and semi-cardinal points applied.

1. *Apparatus.*
   a. Molding board with plane surface of sand. [The molding board should be in a horizontal position with its ends pointing towards the ends of the room.]
   b. Tape-line and yard-stick.
2. *Measurements.*
   a. Children measure ; class observe ; teacher confirm.

b. Measurements reduced to a scale.

c. Teacher question, and draw in sand; class observe.

3. *Objects represented.*

a. Doors.

b. Windows.

c. Teacher's table.

4. *Reproduction.*

Drawing reproduced on paper by each child, each step being directed by the teacher.

NOTE.—It should be made possible for each child to face *North* when he draws his first plan (of schoolroom). While drawings are in position (i. e., with their represented directions coinciding with the real directions) children should letter them in the corresponding margins, N., E., S., W.

5. *Edges of paper*

Children should be led to state that the top edge of the paper is the north edge; the right edge is the east edge; etc., etc.

6. *Changes of position.*

Children change position of drawings and state that the drawings still show correct positions and directions of objects in the room, and also of the walls of the room.

7. *Drawings on the wall.*

Children place drawings on the north wall and state

that the upper edge is now the north edge; that the right edge is still the east edge; etc., etc.

8. *Drawing defined.*

Because this is a representation of the floor, doors, windows of the school-room, it is called a plan of the school-room.

VII. Plan of school block with cardinal and semi-cardinal points applied.

1. See (1) below VI.
2. See (2) below VI.
3. *Objects represented.*
   a. Frontage of school grounds and of all other grounds in block.
   b. Sidewalk.
   c. Shade trees.
4. See (4) below VI.
5. See (5) " VI.
6. See (6) " VI.
7. See (7) " VI.
8. *Plan of school block defined.*

   Because this is a representation of a portion of the surface of the earth, it is called a *map* (of the school block).

VIII. Streets of the city in their relation to the school block.

1. *Cardinal points considered.*
2. *Location, direction, distance.*

The term *location* as it is used in these outlines, implies *direction* and *distance.* Children should make thorough and frequent application of the ideas of cardinal and semi-cardinal directions during their study of the city and its surroundings. They should also make actual measurements of distance until they can estimate short distances either in feet, yards or rods with considerable accuracy. Children will be interested to know how many minutes it takes them to walk a mile, a half mile, a quarter of a mile. Estimating distance by means of time, either absolute or comparative time, is of greater practical value than by means of standard linear units. "How long will it take?" is the correlative of "How far is it?" Children should learn first-hand the length and width of the city blocks, and then they should use these dimensions in calculating city distances.

3. *Home geography.*

"The very first step in a knowledge of geography, is to know thoroughly the district where we live."—*Ritter.*

"Wherever our home is, there lie all the materials which we need for the study of the entire globe."—*Ritter.*

"The study of our own district is the true key to the understanding of the forms and the phenomena of foreign lands."—*Ritter.*

"Every little nook and shaded corner is but a reflection of the whole of nature."—*Humboldt.*

IX. Description of the city

1. *Streets.*
   - *a.* Names.
   - *b.* Directions in which they extend.
   - *c.* Location.
   - *d.* Direction and distance of streets from lake, river, and streets that are *above, across, below, between, beyond, near, off from,* etc., other streets. Children learn distances from actual measurements.
2. *Bridges.*
   - *a.* Names.
   - *b.* Location.
   - *c.* Length.

NOTE.—Show pictures of Brooklyn bridge, Niagara Suspension bridge, and others. Children note differences in their construction, etc. Show pictures of street scenes in other cities.

3. *Wards.*
   - *a.* Number.
   - *b.* Names.
   - *c.* Location with regard to,—
     - (1) lake,
     - (2) river,
     - (3) adjoining wards.

d. Boundaries—natural and artificial.

4. *Street railways.*
   a. Name.
   b. Location.
   c. Termini.
   d. Length—in blocks; in miles.
   e. Officers.
5. *Parks.*
   a. Names.
   b. Location.
   c. Extent—length, width, area—equal to two blocks.
   d. Uses.
      (1) Resorts,
          pleasure,
          health.
      (2) Mass-meetings.

NOTE.—Show pictures of Central Park and others.

6. *Public buildings.*
   a. Names.
   b. Location.
   c. Direction and distance from school-house.
   d. Uses.
   e. Occupants.
7. *Educational institutions.*
   a. Names.
   b. Location—direction and distance.
   c. Uses.

d. Occupants.

e. Officers.

NOTE.—Show pictures of similar institutions in other cities.

8. *Charitable institutions.*

a. Names.

b. Location.

c. Uses.

d. Officers.

NOTE.—Present pictures of similar institutions.

9. *Banks.*

a. Names.

b. Location.

c. Uses.

d. kinds.

e. Officers.

NOTE.—Present pictures of other banks.

10. *Churches.*

a. Names.

b. Location.

c. Pastors.

NOTE.—Present pictures of noted churches.

11. *Manufactories.*

a. Names.

b. Location.—*Emphasize reasons for location.*

c. Uses.

d. Officers.

NOTE.—Present manufactured articles, when practicable.

12. *Railway stations.*
    a. Names.
    b. Location.
    c. Uses.

NOTE.—Present pictures of imposing railway stations.

13. *Railroads.*
    a. Names.
    b. Direction.
    c. Termini.
    d. Uses.
    e. Officers.

NOTE.—Show views of landscapes seen along the lines of our railroads, as well as of others.

14. *Canals.*—Same as railroads.

N. B.—Teach about hydraulic canals and locks.

15. *The lake.*
    a. Name.
    b. Location—with regard to the city.
    c. Use. (Commercial use.)

16. *The river.*
    a. Name.
    b. Location—with regard to the city.
    c. Use. (Commercial use.)

17. *Shipping.*
    a. Kinds.

b. Causes.

c. Results.

NOTE.—This work underlies commercial geography.

18. *The fort.*

a. Name.

b. Location. [Reason for.]

c. Uses. [Reasons for peculiar form.]

d. Officers.

e. History.

NOTE.—Present pictures of our former forts, and also of other forts.

This work underlies military geography.

19. *The weather station.*

a. Name.

b. Location. [Reasons for.]

c. Use.

d. Officers.

(1) appointed by whom ?

(2) paid by whom ?

(3) duties of ?

e. Storm signals. [Name and describe.]

f. Excursion to. [Apparatus explained.]

g. Weather maps, charts, reports.

NOTE.—Geography pupils should make and record daily observations of the weather, noting,—

(1) frost or dew,

(2) direction and force of wind,

(3) extent and kind of clouds,
(4) precipitation [snow, rain, hail, etc.], or fog,
(5) temperature,
(6) barometric pressure,
(7) sun-rise,
(8) sun-set,
(9) moon's phases,
(10) moon-rise or moon-set,
(11) morning star,
(12) evening star.

NOTE.—Children early learn to make "graphic" charts of the different aspects of the weather. The daily weather bulletin should occupy a conspicuous place on the black-board.

20. *The life-saving station.*

a. Name.
b. Location. [Reasons for.]
c. Use.
d. Officers,—
(1) appointed by whom?
(2) paid by whom?
(3) duties of?
e. Excursion to.
(1) Exhibition of service witnessed.
(2) Apparatus explained.

NOTE.—Children should be required to make these observations the subject of written compositions.

21. *City map presented.*

a. Teacher question, children name and locate all places studied ; hence the *name* of the map.

b. Teacher lead children to see that people must be acquainted with the city in order to make the map ; and that strangers may learn from the map the location of the streets, public buildings, etc., of the city, —hence the *use* of the map.

X. Inhabitants of the city

1. *Nationality.*

a. Who of you were not born in America ?
b. Where were you born ?
c. Whose parents were not born in America ?
d. Where were they born ?
e. Point toward the land of their birth.
f. In what direction are you pointing ?
g. Then the land of their birth is in what direction from us ?
h. How did they reach America ?
i. How long were they coming ?
j. Where did they land ?
k. Point toward the place.
l. Who were born in America ?
m. Whose parents were born here ?

2. *History.*—Told in stories and pictures of life in Germany, France, Ireland, etc , as the case may be,—especially stories and pictures of child-life.
   a. Sports.
   b. Occupations.
   c. Clothing —Styles of dress
   d. Food.
   e. Observance of Christmas and national holidays.
3. *Patriotism.*—Material for lessons on home and native land.
   a. Object.—To develop power of reflection.
   b. Point.—To develop ideas of and give terms,—
      (1) House of my birth.
      (2) Dwelling-house.
      (3) Birth-place or native place.
      (4) Dwelling-place.
      (5) Home or country or native land. Also develop some sense of the significance of home and country.
   c. Matter.
      (1) The house in which I was born is the house of my birth.
      (2) The place to which the house of my birth belongs is called my birth-place or my native place or my native city.

(3) The house in which I live is called my dwelling-house or my home.

(4) The place in which I live is called my dwelling-place.

(5) The region or country in which my dwelling-place lies is called my home or my country.

(6) Every person ought to know something about his home or country.

(7) Every man remembers his home kindly. When he is away from his home, he thinks with pleasure of returning. He has pleasant memories of home.

(8) Every man feels that he owes something to his country. When it is in danger, he will do all he can for it; he will die for it, if necessary.

NOTE.—The above matter should be prepared in lessons in such a way that children will feel some of the force of the expression "Our Country".

Stories told and pictures shown of life in America, especially of life in New York, New England, the West, and the South. Stories and pictures of the Revolution.

Meaning of Our Flag, Lincoln's birthday, Washington's birthday, Arbor day, Decoration day, Fourth of July, Labor day, general election day, and Thanksgiving.

N. B.—In the indicated story work, do not lose sight of the fact that you are teaching geography. Only true stories should be told. Fairy tales, legends, and fables have no place here. Do not present outline maps. Good blackboard sketches are better now.

4. *Occupations.*

   a. In what ways are the people of this city earning their living?

N. B.—Do not ask children to tell in what ways their parents are earning their living. Why not?

NOTE.—Present pictures of different kinds of occupations.

5. *Number.* (Population, especially school population.)

XI. The government of the city

1. *Officers.*
   a. Names.
   b. Number.
   c. Duties.
   d. Term of office.
   e. Salaries.
2. Election tickets presented, and manner of voting explained.

NOTE.—This work underlies political geography.

XII. The surroundings of the city

1. *The river.*
   a. Name.

b. Position with regard to the city.

c. Source.

d. Mouth.

e. Banks { materials. / names. { east, west. / right, left.

f. Bed { slope—rapids. / precipice—falls.

g. Channel.

h. Windings { number. / size. / causes. / uses.

i. Current.

j. Silt in river.

k. Dimensions,—length, width, depth.

l. Islands in.

m. Character of water { flowing. / cold. / fresh

n. Uses { water-supply. / ice-supply. / food-supply. / water-road. / water-power.

o. Tributaries { name. / definition. / parts, uses, etc., as of river.

NOTE.—So far as possible the river itself should be studied. Excursions should be made to get facts first-hand, whenever practicable; after which teacher represent the river on molding board, and children draw it on paper.

2. *The lake.*

a. Name.

b. Position with regard to city.

c. Shore { materials. / points. { peninsula. / cape,—promontory. / bays.

NOTE.—Children should make drawings of sections of the shore to show height, formation, projections and indentations.

d. Foot—outlet—St. Lawrence.

N. B.—Teach inlet. Oswego river, Genesee river.

e. Head.

f. Bed { slope. / precipice.

g. Waves { force. / action on shore and stones.

NOTE.—Children bring to class water-worn stones,

also stones not water-worn, and compare their form and surfaces.

h. Dimensions—length, width, depth.

i. Islands in.

NOTE.—Present views of the Thousand Islands.

j. Character of water { standing. / cold. / fresh.

k. Curvature { proof of. / what inference ?

l. Uses { water-supply. / ice-supply. / food-supply. / water-road.

m. Teacher represent lake on molding board, and children draw it on paper. Do *not* present the outline map.

3. *Harbor.*

a. Name.

b. Location.

c. Silt in water { How get there ? / How get it out ? Why ?

d. Dimensions—length, width, depth.

e. Uses.

f. Care and expense of ? Assumed by whom ?

4. *Pier.*

a. Name.

b. Location.

c. Dimensions—length, width, height.

d. Uses.

e. Care and expense of. Assumed by whom?

5. *Light-houses.*

a. Names.

b. Location.

c. Height.

d. Uses.

e. Lights—kind of.

f. Keeper { salary. / paid by?

g. Care and expense of? Assumed by whom?

NOTE.—Present pictures of noted light-houses.

6. *Public roads.*

a. Name.

b. Directions.

c. Lead where?

d. Width—3 or 4 rds. wide.

e. Controlled by whom?

7. *Cemeteries.*

a. Names.

b. Location.

c. Officers.

8. *Fair grounds.*

a. Name.

b. Location.

c. Uses.

d. Officers.

9. *Asylum hill.*

a. Name.

b. Location with regard to the city.

c. Comparative height.

d. Parts { top (summit), bottom, or foot (base), sides (slopes)—length of.

e. Materials.

f. Uses { outlook, health—state of the atmosphere, beauty.

NOTE.—Present pictures of other hills, some of which should be very high (mountains). Children name parts as shown in pictures.

10. *Plain and valley.*

NOTE.—Ideas of *plain* and *valley* should be developed when excursions are made; their locations noted, forms compared, and lastly definitions made by the children.

The teacher should at all times make as careful preparation for an excursion as for laboratory work or as for a recitation.

11. *The country.*—(Observe from highest point accessible to the class, as well as during excursions.)

a. Land forms { hills, ridge of hills; valleys, plains, swamps.

NOTE.—Observe the relation of valleys to hills.

b. Water forms { brooks, creeks;
springs, ponds.

NOTE.—Observe the relation of water forms to land forms. Compare ponds and swamps, observe likenesses and differences. Observe the relation of hills to springs, and of springs to streams.

c. Soil {
- Nature.—Gravel, sand, loam, clay.
- Color.—Gray, brown, black.
- Sources.
- Depth.
- Fertility.—Very fertile, fertile, poor or sterile.

NOTE.—Collect soils in bottles or boxes and label each.

d. Minerals { sandstone,
boulders (not native).

NOTE.—Collect and label minerals.

e. Plants,—Uses {
- for food (vegetables, fruits, grains),
- for lumber,
- for fuel,
- for medicine.

NOTE.—Specimens of native wood observed. Observe differences in color, odor, hardness, arrangement of fibers (graining).

- *f.* Animals
  - domestic
    - kinds,
    - uses.
  - wild
    - kinds,
    - uses.

NOTE.—Present stuffed specimens or pictures of native wild animals. Visit the zoölogical laboratory.

- *g.* Products
  - animal
    - milk, butter, cheese, meats,
    - fats, eggs, feathers, hides, hair, glue, fertilizer, etc.
  - vegetable
    - vegetables, fruits,
    - grain, fodder, hay.
  - mineral
    - sandstones, bricks,
    - pottery, drain-tiles.

- *h.* Occupations
  - farming.
  - gardening.
  - dairying.
  - stock-raising.
  - poultry-raising.
  - quarrying.
  - brick-making.

i. Hamlets
- names.
- direction from the city.
- distance from the city.
- number of inhabitants, compared with each other and with the city.

j. Relations with the city
- commercial.
- educational.
- social.

B JUNIOR—FIFTH GRADE

XIII. The Seasons

a. Spring
- months of ;
- comparative length of day and night ;
- general temperature ;
- atmospheric products ;
- sports of children ;
- occupations determined by season;
- holidays.

b. Summer—See Spring.

c. Autumn—See Spring.

d. Winter—See Spring.

NOTE.—Children make daily reports of the weather, rising and setting of the sun, etc., and record the same in a B. B. tabular view.

Children learn how to use the almanac, to make individual records on paper, to average, to summarize, and to make weekly reports, stating at what hours observations were made. They should note points in the horizon which mark the sunrise and the sunset.

Children draw horizon on paper the twenty-first day of each month, locate their own position, the cardinal and semi-cardinal points and the points of sunrise and sunset.

Children compare these points from month to month, state from what time to what time they decrease in distance; from what time to what time they increase in distance; and when they are nearest together, and when farthest apart.

Children led to observe when the shortest day occurs; when the day and night are of equal length, and when the longest day occurs.

Children led to state that the sun moves through space, and that it *seems* to move from east to west. Similar regarding the moon. Children asked to note at evening the positions of certain stars in the heavens, as the evening star, etc.; then, before retiring, note their positions again, and state as they have already stated regarding the sun and moon.

Teach what twilight (two lights), and what evening and morning twilight are.

Children should measure the shadow of a fixed object at noon, the twenty-first day of each month. This measure in feet and fraction of a foot, or inches and fraction of an inch, should be recorded.

Children compare these measures from month to month, state from what time to what time they increase in length, from what time to what time they decrease in length, and note the date when the shadow is the longest, when it is the shortest, and when its length is half the sum of its longest and shortest lengths.

Lead children to observe that the longer the shadow, the shorter the distance of the sun from the horizon.

Lead children to connect the shortest day, the low noon sun, its southerly position at rising and setting with the cold weather of winter.

Lead children to connect the opposites of the above.

N. B.—Do *not* present the globe. Do *not* attempt to explain these phenomena at this stage of the work. These facts, however, may be learned first-hand, and will render the study of astronomical and mathematical geography far easier in later lessons. Children may learn that things *are* so, long before they are able to learn *why* they are so.

XIV. Atmospheric phenomena.

1. Observe the rise and fall of water in the river.
2. Observe effects of rains and melting snows upon the rise of the river.

   Observe the effect of continued drought upon the fall of the river.
3. The water of the earth flows to the sea (ocean) in brooks, creeks, and rivers.
4. During its course, a part of it rises into the air in the form of vapor.

   A part of the water of the sea rises into the air in the form of vapor.
5. This vapor condenses into clouds.

6. The clouds are driven by the wind over the whole earth.

   When they are heavy and full of water (vapor) they are dark gray, often nearly black.

7. Water falls from the clouds in the form of rain, hail or snow.

8. When the water vapor is in the air near the earth it is condensed on the plants in the form of dew.

   Frozen dew is called hoar frost, or rime.

9. When the air near the earth is heavily laden with water-vapor, there is mist or fog.

10. Clouds, rain, hail, snow, sleet, mist, fog, dew, and frost are *aqueous atmospheric phenomena.*

11. The atmosphere (the air) surrounds the earth.

12. It varies at different times and in different places.

13. It may be warm or cold, moist or dry, pure or impure.

14. In spring the air is generally damp and cool, sometimes foggy.

15. In summer the air is generally dry, warm, and sultry.

16. In autumn—(See 14).

17. In winter the air is generally dry and cold.

18. Air moving from a certain direction is called according to its rapidity, zephyr, breeze, gale, hurricane.

19. The state of the atmosphere (the air) in regard to heat or cold, moisture or dryness, purity, or impurity, for a short period of time is called *weather*.

20. The state of the atmosphere in regard to heat or cold, moisture or dryness, purity or impurity, for a long period of time is called *climate*.

The prevailing weather of a region for a long period of time, is called *climate*.

21. Three kinds of climate are distinguished ; hot, cold, and temperate.

NOTE.—Local climate observed and distinguished.

22. The condition of the land is influenced by winds and climate, as very fertile, fertile, etc.

XV. Brook Basin—Field Lessons

1. *Preliminary questions—answers found in nature.*

a. How deep into the land does rain go ?

b. What stops it ?

c. In what direction does it flow then ?

d. Why do not rains finally fill the soil ?

e. What becomes of the water ?

f. Where will it come out ?

g. What is water springing from the earth called ?

h. Where does most of the water of springs go ?

i. Where does water in brooks come from ?

j. Where does the water in brooks go ?

k. In what direction must a brook flow ?

l. Why do some brooks flow more rapidly than others ?

m. Why do brooks wind about ?

n. What do brooks do for the land through which they flow ?

o. Which holds water longer, sand or loam ?

p. What are all the uses of water in the soil ?

2. *Brook.*

a. Name—special.

b. Location—direction and distance from the school-house.

c. Source.

d. Mouth.

e. Direction of flow.

f. Banks { names { right, left ; / cardinal directions. } / materials. }

g. Bed—The hollow which holds the brook.

h. Channel.

i. Current
- rapidity
  - A moderate flow equals $6\frac{2}{3}$ rods per minute.
  - A torrent flow equals 100 rods per minute.
- determined by
  - slope.
  - windings
    - number.
    - size.

j. Windings
- number.
- size.
- causes.
- uses
  - to brook.
  - to man.

k. Silt.

l. Delta.

m. Dimensions
- length.
- width.
- depth.

n. Islands in.

o. Water
- flowing.
- cold.
- fresh.

p. Uses
- water-supply.
- food-supply.

NOTE.—Observe the relation of (e), (g), (i), (j), (k), (m), and (n), to the character of the slopes.

3. *Tributary.*
   - *a.* Name—special.
   - *b.* Definition.
   - *c.* Number.
   - *d.* Location, parts, etc., as of brook.

4. *System.*
   - *a.* Definition.
   - *b.* Name—special.

5. *Basin.*
   - *a.* Definition.
   - *b.* Name—special.
   - *c.* slopes.
     - (1) Definition.
     - (2) Number.
     - (3) Names { source, right, left. / apply cardinal directions. }
     - (4) Direction.
     - (5) Length { comparative. / absolute. }
     - (6) Breaks { number. / parts compared. }
     - (7) Degree (whether gradual or steep).
     - (8) Soil (differences from brook to water-parting).
     - (9) Vegetation { kind. / quantity. / quality. }

NOTE 1.—Children collect soils from different parts of the slope, label them with regard to locality, study them in the class-room, note differences, give reasons for the differences, and observe the relation of the character of the soil to the kind, quantity, and quality of the vegetation.

NOTE 2.—Present pictures of slopes, and lead children to state the character of the drainage.

d. Kinds { Open (slopes on three sides from the water-parting).
Closed (slopes on all sides from the water-parting).

e. Boundary { water-parting (definition).
shore-line (definition).

NOTE.—Lead children to observe that the water-parting of the brook basin is *the crest* of the ridge of land.

f. Shape. (Open basins generally triangular.)

g. Size.

NOTE.—Teacher present, children find, brook basins in pictures. Teacher and children mold brook basin just studied. Teacher sketch brook basin on blackboard. Children draw same on paper.

QUESTIONS

Teacher.—If the stones we see about us were used to build a tight wall across the open side of this brook basin, what would be the effect upon the flow of the brook ?

Children.—It would stop the flow.

T. How long would it stop the flow ?

C. Until the basin was full ; or, until the water had reached the top of the wall ; or, until the water reached the lowest place in the water-parting.

T. What will the water in the basin then be called ?

C. A pond.

T. And what kind of basin would the basin then be called ?

C. A pond basin.

T. Where would the brook and its tributaries be then ?

C. At the bottom of the pond.

T. What would all the land covered by the pond be of the pond ?

C. The bed of the pond.

T. What would the water-parting be of the pond ?

C. The bank or shore of the pond.

T. In what respect would the water of this pond be unlike the water of the brook ?

C. It would be still water or standing water.

Here lead the children to state that when man aids in the formation of a pond, it is called an artificial pond ; that when nature alone forms a pond, it is called a natural pond.

Children name natural ponds in the vicinity of the school-house, one of which may be studied for the following lesson.

The work on artificial pond helps the child to a clearer notion of what a pond really is,—of its bed, slopes of bed, inlets and outlet, and its islands.

The bed of the pond is uneven. Some of the high portions are little hills. Several of these hills are not entirely covered with water, and their tops form islands in the pond.

If the foot of the pond were reduced to the level of the slopes at their lower edges, then the inlets would become tributaries of the outlet; and the outlet and its tributaries would form a brook system.

MATTER TO BE USED IN DEVELOPING IDEAS OF BROOK BASIN

1. A small stream of water flowing through the land, is (sometimes) called *a brook.*
2. A small stream of water flowing through the land, and into a brook, is *a tributary* of the brook into which it flows.
3. A brook and all its tributaries is *a brook system.*
4. All the land drained by a brook and its tributaries, is *a brook basin.*
5. Land surface which is neither horizontal nor vertical is *a slope.*
6. Two slopes meeting at their lower edges, form *the bed* of the stream.
7. A brook basin is a combination *of slopes.*

8. The slope in which a stream rises is called the *source slope.*
9. The slope on the right side of a stream, is called *the right slope.*
10. The slope on the left side of the stream, is called *the left slope.*
11. A basin enclosed on three sides only is *an open basin.*
12. A basin enclosed on all sides is *a closed basin.*
13. The line from which water flows in opposite directions, is *a water-parting.*
14. Two slopes meeting at their upper edges, form *a water-parting.*
15. The water-parting is a part or the whole of the *bounding line* of the brook basin.
16. The line which separates two brook basins is *a water-parting.*

XVI. Pond

1. Name—special. Reasons for name.
2. Definition.
3. Position—direction and distance from schoolhouse.
4. Parts.
   - *a.* Shores
     - number—two.
     - names
       - right and left.
       - cardinal directions applied.
     - kind
       - according to height.
       - according to material.

b. Foot (consider outlet and inlets).

c. Head.

d. Bed.

e. Dimensions { length. / width. / depth.

f. Islands in { number. / form.

g. Water { standing. / cold. / fresh.

5. Uses.

a. Water supply.

b. Ice supply.

c. Food supply.

NOTE.—Teacher present pictures of ponds. Children find and name parts. Teacher and children mold pond in sand. Children draw map of pond, using a scale.

XVII. The county—county map presented

NOTE.—Review work on city map, especially with reference to wards and natural features.

1. Towns.

a. Number.

b. Names.

2. Rivers.

a. Name.

b. Location.
c. Course.
d. Flows into.
e. Islands in.
f. Uses.

3. Lakes.
   a. Name.
   b. Location.
   c. Islands in.
   d. Uses.

4. Falls.
5. Mountains.
6. Mines.
7. Quarries.
8. Caves.

a. Name.
b. Location.
c. Uses.

9. Railroads.
10. Canals.

See IX, 13, 14.

11. Cities.
12. County-seat.
13. County officers.
    a. Names.
    b. Duties.
    c. Term of office.
    d. Salaries.

A JUNIOR—SIXTH GRADE

XVIII. The earth in space—one of the planets

NOTE 1.—Review, with objects, *sphere, surface, spherical surface, diameter,* and *circumference.* Present sphere, and lead children to state how much of its surface can be seen at one time.

Lead children to discover that a spherical surface obstructs the view between two given points.

Lead children to discover that a plane surface does not obstruct the view between two given points.

Review *cardinal points,* and *position of north star.*

Have children trace the apparent course of the sun from sunrise to sunset.

NOTE 2.—Plain spheres, *not* globes, should be used in this work.

1. *Shape.*
   - *a.* If a man travel eastward from New York and continue in the same direction, he will in time come to New York again.
   - *b.* If a man travel westward from San Francisco, Cal., and continue in the same direction he will in time come to San Francisco again.

Query.—That a man may be able to continue his journey eastward or westward, and return to his starting

place, what shape do you think the earth must be in these directions?

c. Wherever men may be on the ocean they see the masts of a ship in the distance, before they see the body of the ship, although the body is larger than the masts.

d. Wherever seamen approach the shore, they see the highest points of land first.

QUESTIONS

(1) What is there between ships at sea and ships at the shore?

(2) What, do you think must be true of the surface of the ocean, that men can not see the whole of distant objects at one time?

(3) Since the ocean covers about three-fourths of the surface of the earth, what shape do you think the whole surface of the earth is?

(4) Then what is the earth, thinking of its shape?

2. *Revolution.*

NOTE.—Recall a ride on the cars. When you looked through the car window, what was peculiar about the appearance of the objects you saw? (Rocks, trees, etc.) In what direction did they appear to move, thinking of the direction of the cars? While you looked at the

rocks, trees, etc., what seemed true of your own motion ?

a. Near what point do we first see the morning sun ?

b. Near what point do we last see the evening sun ?

c. How does the sun seem to move with regard to the earth ?

d. Once all people believed this ; now it is believed only by ignorant people. It has been proved that the earth moves around the sun, that it moves from west to east, and that it takes a year for the earth to return to a given starting point.

e. The moving of the earth around the sun, is called *a revolution.*

f. The course of the earth around the sun, is called the *orbit of the earth.*

g. Since the earth is a sphere, how much of its surface must be in sunlight at one time ?

h. What do we call the period of time from sunrise to sunset ?

i. What do we call the period of time from sunset to sunrise ?

j. What is the length of the period of time from sunrise to sunrise ?

k. Then how often do we have a period of sunlight ?

l. Upon what does the earth depend for its light ?

m. Since the earth depends upon the sun for light, having none of its own, and since it revolves around the sun, it is called a *planet* of *the sun.*

n. Planet means wanderer.

o. The exact time in which the earth revolves around the sun, is 365 days, 5 hours, 48 minutes, and 48 seconds.

p. Because each year contains almost three hundred sixty-five and one-fourth days, every fourth year is reckoned three hundred sixty-six days.

q. To which month is the extra day added ?

r. Why do you think it is added to this month rather than to any other ?

s. What is a year of three hundred sixty-six days called ?

t. Because every fourth year *leaps* forward a day, it is called *leap-year.*

u. What is a year of three hundred sixty-five days called ?

3. *Rotation.*

a. Since the sun does not move around the earth, and since it takes the earth a year to move around the sun, what must occur to

give us a period of sunlight every twenty-four hours ?

b. Since the earth is a sphere, it must turn on a diameter.

c. The turning of the earth on a diameter is called the *rotation of the earth.*

d. What does the rotation of the earth produce ?

e. How often does the earth perform a rotation ? [Illustrate direction of rotation.]

f. The diameter on which the earth rotates is called the *axis of the earth.*

g. The axis extends through the earth north and south.

h. The ends of the earth's axis are called *poles.*

i. The northern end of the earth's axis is the *north pole.*

j. The southern end of the earth's axis is the *south pole.*

k. The north pole is the most northern point of the earth's surface.

l. The south pole is the most southern point of the earth's surface.

m. The north pole points toward the north star.

NOTE.—Teacher present a plain sphere, and say, "For a few moments, let this represent the earth."

(1) Touch two points between which the axis may extend.

(2) In what directions does the axis extend ?

(3) Hold the sphere so that the axis will extend in its true directions.

(4) Rotate the sphere as the earth rotates.

(5) Touch the most northern point of the sphere.

(6) What does this point represent of the earth ?

(7) To what does it point ?

(8) Touch the most southern point of the sphere.

(9) What does the point represent of the earth ?

(10) How often does the earth perform a rotation ?

(11) How often does the earth perform a revolution ?

(12) How many days in a year ?

(13) How many rotations does the earth perform during one revolution ?

(14) How many motions has the earth ?

(15) Teacher get terms, *daily* or *diurnal motion;* also *yearly* or *annual motion.*

4. *Size.*

a. It has been found by calculation that the axis of the earth is the shortest diameter of the earth.

b. The axis of the earth is called the *polar diameter of the earth.*

c. The polar diameter is twenty-six miles shorter than the longest diameter of the earth.

d. Because the polar diameter is the shortest

diameter, what do you think is true about the shape of the earth at the poles ?

e. If a man could travel on the longest diameter through the earth at the rate of 300 miles per day; it would take him almost $26\frac{1}{2}$ days to make the journey. What is true about the length of the longest diameter of the earth ?

NOTE.—The longest diameter of the earth is 7,925 miles.

f. If a man travel at the rate of 300 miles per day, he may travel around the earth in about 83 days. About what is the circumference of the earth ?

NOTE.—The greatest circumference of the earth is 24,899 miles.

g. The circle which measures the greatest circumference of the earth is, at all points, half-way between the poles.

h. The circle which measures the greatest circumference of the earth is called the *equator.*

i. In geography, a circumference is called a *circle,* therefore the greatest circle of the earth is called the *equator.*

j. A diameter terminated by the equator is called an *equatorial diameter.*

k. An equatorial diameter is longer than any other diameter.

l. An equatorial diameter is twenty-six miles longer than the polar diameter.

NOTE.—Children show with sphere what is meant by the axis of the earth, and state which diameter it is with regard to length and location. Children locate longest diameter and give special name. Children compare equatorial and polar diameters with regard to direction and length.

5. *Hemispheres.*

NOTE.—Teach hemispheres with plain spheres and hemispheres.

a. The equator divides the earth into two equal parts.

Each part is called a hemisphere. "Hemisphere" means *half-sphere.*

b. Since the equator is a circle, and since it divides the earth into two equal parts, it is called a *great circle.*

c. What is the hemisphere north of the equator called?

d. What is the hemisphere south of the equator called?

6. *Latitude.*

NOTE.—Teach latitude with plain spheres.

a. Distance north and south from the equator is called *latitude.*

b. Distance north from the equator is *north latitude.*

c. Distance south from the equator is *south latitude.*

d. Places in the northern hemisphere are in north latitude.

e. Places in the southern hemisphere are in south latitude.

f. In what latitude is the north pole? Why?

g. In what latitude is the south pole? Why?

h. Where does latitude begin? Then in what latitude is the equator?

i. Where does latitude end? What amount of distance have the poles from the equator? Then what latitude have the poles?

NOTE.—When latitude and longitude are taught in close succession of time, the terms are usually confounded. Hence, it is better to defer the teaching of longitude for a while.

Because the teaching of longitude is deferred, the teaching of eastern and western hemispheres is necessarily deferred.

At this point review or teach *objectively* the table of circular measure. Emphasize the fact that circular measure deals with *distance,* and that its minutes and seconds must not be confounded with minutes and seconds of *time.*

Lead children to see that the length of a degree varies with the size of the circle.

7. *The Seasons.*

NOTE.—Review objectively *axis,* and terms, *vertical, horizontal, oblique, perpendicular, inclined, inclination,* and *orbit.*

Review source of the earth's light, names of the months in order, time of shortest day and of longest day, time when day and night are equal, time of lowest mid-day sun, and of highest mid-day sun. (See indicated work in note under XIII.)

a. Teacher lead children to find surfaces which may be parallel to all points of the straight edge of a ruler. Children or teacher give term *plane surface.*

b. A plane surface is often called *a plane.*

c. A surface, any two points of which may be joined by a straight line, so that every point of that line will be in the surface, is *a plane.*

d. The space bounded by the earth's orbit, is called *the plane of the earth's orbit.*

e. Illustrations.

(1) Cut a large disc of paper. Draw a colored line around its margin. Place paper in horizontal position. What may the colored line represent? What may the paper within the line represent?

(2) Describe a large circumference on blackboard. What may the circumference represent?

What may the space inclosed represent?

f. Teacher describe a circumference on blackboard (west blackboard if possible), draw its horizontal diameter, and its vertical diameter, and divide upper right quadrant into four equal parts by drawing radii.

Children state at each step what the teacher has done. Children hold rulers to represent the vertical diameter, and then incline them to the right (which should be north) a trifle more than one-fourth of a quadrant.

Children state that one-fourth of a quadrant equals $22\frac{1}{2}°$. Teacher tell children that the inclination exceeding $22\frac{1}{2}$ degrees is one degree, hence the amount or inclination is $23\frac{1}{2}$ degrees.

Children hold spheres so that their axes are vertical, and then incline them northward $23\frac{1}{2}$ degrees.

Teacher hold inclined sphere (say) at the southern point in the colored margin of the paper disc. (See *Ill.* in *e.*)

Children state what the margin of the paper and the sphere represent.

Children state that since these objects represent the *orbit, the plane of the earth's orbit,* and *the earth,* then the earth's axis is inclined 23½ degress to the *plane of the earth's orbit.*

Children show the inclination using blackboard circumference.

g. Teacher question for position of sun in earth's orbit.

h. Teacher illustrate position of earth in its orbit on March 21, and the relation of the position to the light of the sun.

Similar work with reference to June 21, September 21, and December 21.

The teacher state that these dates are really the dates when the seasons begin. The seasons are caused by the inclination of the earth's axis to the plane of the earth's orbit.

8. *Zones.*

a. Children represent poles and equator on a plain sphere.

Teacher illustrate what is meant by vertical rays of the sun, and when rays are vertical at the equator.

Teacher illustrate northern limit of vertical rays; locate (direction and distance from the equator) and represent the circle which bounds the limit.

This circle is called the *Tropic of Cancer.*

b. Teach objectively that when the sun's rays are vertical at the Tropic of Cancer, the sun lights the earth $23\frac{1}{2}$ degrees beyond the north pole. During a rotation of the earth, the line of light describes a circle.

Teacher locate (direction and distance from the north pole), and represent the circle.

This circle is called the *Arctic Circle.*

c. In a similar way, teach and locate, *Tropic of Capricorn* and *Antarctic Circle.*

d. Get from children the terms, *Polar circles, North Polar circle,* and *South Polar circle.*

e. The divisions of the earth's surface made by the tropics and polar circles, are called *zones.*

f. Teach boundary, width, climate, and name of each zone.

NOTE 1.—Teach what is meant by *small circles of the earth* and *parallels.*

NOTE 2.—Children locate tropics and polar circles with regard to latitude. Children give exact latitude of *tropics, polar circles,* and *poles.* Children state the distance in degrees of each pole from the equator and of one pole from the other, and note the relation of the distance to the circumference of the earth.

9. *Longitude.*

a. The circumference of the earth north and south is called a *meridian circle.*

b. A meridian circle divides the earth into two equal parts.

c. Since a meridian circle divides the earth into two equal parts, it is called a great circle.

d. How many meridian circles may there be?

e. One-half of a meridian circle, extending from one pole to the other, is called a *meridian.*

f. The meridian passing through Greenwich, England, is called the *prime meridian.*

g. Distance east or west from the prime meridian, is called *longitude.*

h. Teach and distinguish between *east* and *west longitude.*

i. The meridian circle 20 degrees west from Greenwich divides the earth into *eastern* and *western hemispheres.* Why this meridian circle? Why not some other?

j. Questions.

(1) Where does longitude begin? Then in what longitude is the prime meridian?

(2) What amount of distance have the poles from the prime meridian? Then what longitude have the poles?

(3) What latitude and longitude has a place where the prime meridian crosses the equator?

(4) What is the greatest longitude a place can have?

(5) What longitude may it be called ?

(6) Whether it is east or west longitude upon what will it depend ?

XIX. The Sun

1. The sun is a sphere of the fiercest fire.
2. The sun gives light and heat because it is white-hot.
3. The sun rotates upon its axis once in twenty-five days.
4. The size of the sun is to the size of the earth, as the size of a sphere two feet in diameter is to the size of a sphere one-fifth of an inch in diameter.

NOTE.—Teacher draw blackboard circles to show comparative sizes.

5. The sun appears small because it is so very far from us.
6. The sun is millions ($91\frac{1}{2}$) of miles from the earth.
7. It takes eight minutes for light to go from the sun to the earth.
8. The sun really sets eight minutes before it seems to set.

XX. The Moon

NOTE.—So far as possible, let the moon tell her own story. When she cannot be understood let simple apparatus, stereopticon views, good pictures, and plain diagrams, be her interpreters.

1. The moon is a sphere.
2. The diameter of the moon is a little more than one-fourth as long as the diameter of the earth.

NOTE.—The diameter of the moon is two thousand one hundred sixty-five miles.

3. The moon appears small because it is so far from us.
4. The moon is thousands (240) of miles from the earth.
5. When the moon looks like a circle, it is said to be *full.*
6. When the moon looks like a crescent, it is said to be *new* or *old.*
7. When the ends of the crescent point towards our left, it is *new moon.* We see the new moon in the west at evening.
8. When the ends of the crescent point towards our right, it is *old moon.* We see the old moon in the east in the morning.

NOTE.—The period of time from one new moon to another is called *lunation.*

9. When the moon is full it is called *half-moon,* because it has then performed one-half of its lunation.

The half-moon shows just one-half of its surface.

10. When the moon looks like one-half a circle, it is called a *quarter.*

When the moon is a quarter, it shows just one-fourth of its surface.

11. The quarter before full moon is called *first-quarter,* because the moon has then performed the first quarter of it lunation.

The moon when first quarter shines the first half of the night, and sets at midnight.

12. The quarter after full moon is usually called *last quarter,* although the moon has then performed but three-quarters of its lunation.

The moon when last quarter shines the last half of the night. It rises at midnight.

13. The full moon that occurs nearest the twenty-first of September is called the *Harvest moon.*

14. The Harvest moon rises but a little later (about twenty-three minutes) for several successive evenings, and thus affords light for collecting the harvest.

15. The changes of the moon's illuminated surface from a thin crescent to a circle and from a circle to a thin crescent are called *phases.*

16. The moon's phases show that the moon has no light of its own.

17. If we were on the moon, the earth would present to us phases similar to those which the moon presents to us now.

18. The bright portions of the moon's surface are

highlands in sunlight. The dark portions are lowlands in the shadows of the highlands.

19. The bright and dark portions of the moon's surface taken together look like a face. The face is called the "man in the moon".

20. The surface of the moon is covered with steep rocks, volcanic craters, and long mountain chains.

21. The moon, like the earth, was once a burning star.

22. The moon revolves around the earth from west to east once in about twenty-seven and one-third days.

23. The moon rotates on its axis from west to east, in exactly the same time that it revolves around the earth.

24. Because the moon rotates upon its axis and revolves around the earth in exactly the same time, it always presents the same side to us.

25. The moon with the earth is revolving around the sun at the rate of about one thousand miles per minute.

26. Because the moon revolves around the earth and, at the same time, revolves with the earth around the sun, it is called a satellite (of the earth).

XXI. Eclipses

NOTE.—Use simple apparatus, stereopticon views, good pictures, and plain diagrams, but do not lose sight of the heavenly bodies.

1. When the moon passes between the earth and the sun it hides the sun partially or wholly from our view. We then say there is an *eclipse of the sun.*
2. When the moon partially hides the sun from our view, we say there is a *partial eclipse of the sun.*
3. When the moon wholly hides the sun from our view, we say there is a *total eclipse of the sun.*
4. An eclipse of the sun is called *a solar eclipse.*
5. When the shadow of the earth partially or wholly hides the moon from our view, we say there is *an eclipse of the moon.*
6. Teach *partial eclipse of the moon.*
7. Teach *total eclipse of the moon.*
8. Teach *lunar eclipse.*
9. In an eclipse of the moon we always see a shadow with a circular edge moving across the moon. This shadow is known to be the shadow of the earth, and it is always the same whatever part of the earth may be facing the moon at the time. To cast a circular shadow in any position, the earth must be a sphere.

XXII. The Planets

1. Review what has been taught regarding the earth as a planet, the body around which it revolves, the direction in which it revolves, the source of its light and heat, and the meaning of the term *planet.*
2. There are other planets which revolve around the sun from west to east at different distances from it.
3. All of the planets receive their light and heat from the sun.
4. The names of the planets in their order from the sun are, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.
5. Jupiter, Saturn, Uranus, and Neptune, are each larger than the earth.
6. Mercury, Venus, and Mars, are each smaller than the earth.
7. Jupiter is the largest of the planets.
8. Mercury is the smallest of the planets.
9. Mercury is not seen by us often, and then only near the horizon for a few minutes after sunset or before sunrise.
10. Each planet except Mercury shines with a steady light.
11. Venus is the most brilliant of all the planets. Objects in its light cast decided shadows.

Venus is called the *morning star* when it shines in the east, and the *evening star* when it shines in the west.

NOTE.—Lead children to distinguish Venus, Mars, and Jupiter, and to note the character and the color of their light.

Present stereopticon views, pictures or blackboard drawings, to show the comparative sizes of the planets, as well as to illustrate their relative distance from the sun.

XXIII. The Stars

1. The stars are spheres of the fiercest fire.
2. The stars shine because they are white-hot.
3. The stars shine with a twinkling light.
4. A group of stars always moving in the same direction and at the same distance from each other, is called a *constellation.*

   The dipper is a part of the constellation called the *Great Bear.*
5. In the whole heavens the stars which can be distinctly seen with the naked eye, do not exceed six thousand. Since only one-half of the heavens is visible at once, then only three thousand stars can be seen at one time.
6. At night we often see a belt of pale light spanning the sky, and frequently dividing it into two nearly equal portions. This belt is called the *Milky Way.*

7. The milky way is composed of millions (at least eighteen millions) of stars so faint and apparently so near together that the eye can see only a dim, continuous glitter.
8. Some stars seem smaller than others, because they are farther from us. Some stars are really smaller than others.
9. Some stars shine with greater brightness than others.
10. The brightest stars are called *stars of the first magnitude.*
11. Some stars shine with a reddish light, some with an orange, some with a blue, and some with a white light.
12. Stars which shine with their own light, and seem never to change their position, are called *fixed stars.*
13. The sun is a fixed star. The North Star is a fixed star.
14. Light goes from the North Star or Polar Star to the earth in forty-five years.
15. Sometimes we see what appear like stars falling from the sky. They are not stars, but *meteors.*
16. Bodies which are illuminated by a fixed star around which they revolve, are called *planets.*

NOTE.—In teaching the above, the children should

be led to observe the character of the light of the stars, the Dipper, the Milky Way, the difference in the brightness and color of stars, the North Star as a fixed star, and meteors.

XXIV. Comets

1. Sometimes strange bodies resembling stars with long shining trains appear in the heavens. These bodies are called *comets*.
2. The star-like part is called the *head* (or *nucleus*) of the comet. The long shining train is called *the tail* of the comet.
3. Comets move more rapidly than any other heavenly bodies.

NOTE —Show stereopticon views, pictures, and blackboard drawings of comets

C SENIOR—SEVENTH GRADE

XXV. The Earth as a Whole—The Home of Man

NOTE.—The following questions will suggest a review which should precede the study of the earth as a whole.

1. What is the earth, thinking of its shape?
2. In what directions does the earth's axis extend?
3. What is the inclination of the earth's axis in degrees?

(Here the teacher should present a simple physical globe free from all astronomical attachments, and place it in position as to direction and inclination of axis.)

4. What is this, thinking of its shape?
5. In what directions does its axis extend?
6. What seems to be the inclination of its axis?
7. Since this is a sphere whose axis extends north and south and inclines $23\frac{1}{2}$ degrees, what may it represent?
8. Since this sphere represents the earth, *what* of the earth may its surface represent?
9. Of what is the surface of the earth composed?
10. Then what may the surface of this sphere represent?

(Here the children should be led to state what color represents water, and what represents land; how the extent of water surface compares with the extent of

land surface; that the water surface may be traversed without crossing the land, but that the land surface cannot be traversed without crossing the water.)

11. Since the surface of this sphere represents the land and water as they are found on the surface of the earth, what is this sphere called?

12. How much of the surface of the earth represented on the globe, can be seen at one time?

13. What must be done to see the other half?

(Here get expression of ideas of *hemisphere, meridian circle, eastern* and *western hemispheres.* Teacher rotate the globe so that each hemisphere may be represented. Locate *poles, equator, northern* and *southern hemispheres.*

Teacher present physical map of the hemispheres and lead children to compare its representations with the representations of the globe.)

14. Because this is a drawing of the earth's surface on a plane, what is it called?

With the aid of the physical hemisphere map and the physical globe, teach what is indicated in the following tabular view:

1. *Continents.*
   - *a.* Number.
   - *b.* Names.
   - *c.* Form.
   - *d.* Relative size.

e. Relative position.

f. In what hemispheres?

g. Boundaries.

DEFINITION :—The great land divisions of the surface of the earth are called *continents*.

2. *Oceans.*

See 1, above, a, b, c, d, e, f, g, same.

DEFINITION :—The great divisions of the sea made by the continents are called *oceans*.

NOTE.—The story of Columbus briefly told and his voyages traced on the map and globe.

3. *Islands.*

NOTE.—Show pictures of islands. Have children recall islands which they have seen.

a. Continental.

b. Oceanic.

c. Distribution—near what continent or in what ocean?

NOTE.—Show pictures of continental and oceanic islands, also any noted islands; name and locate each on map and globe.

4. *Coast Line.*

DEFINITION :—The land next to the sea is called *the coast*. The line where the land and sea meet is called the *coast line.*

NOTE.—Show pictures of noted coasts. Locate these coasts on map and globe.

a. Continental irregularity.

b. Land projections — peninsulas or capes. Teach names of peninsulas and capes.

(1) Position—from what part of what continent?

(2) Adjoining waters—arms of what ocean?

c. Water projections—gulfs or bays. Teach names of gulfs and bays.

(1) Position—from what part of what oceans?

(2) Adjoining lands—projections of what continents?

NOTE.—Associate some physical, commercial, or historical event with each projection located.

Compare the coast line of the continents each with the others, with regard to irregularity.

Compare the projections of the continents with regard to number and size; also with regard to the direction in which they project.

5. *Relief*

a. World Ridge.

NOTE.—Lead children to observe a ridge,—its direction, length, height, and appearance at the crest; also to observe the slopes,—their degree and comparative lengths.

Lead children to observe basin,—the number, comparative length, and degree, of the slopes which form it.

Lead children to observe the water-parting, the shape, extent, and lowest part of the basin.

Children use these concepts to apperceive the world ridge.

Use relief globe and relief map of the land hemisphere.

(1) Direction.
(2) Length traced.
(3) Relative height.
(4) Highest place in.
(5) Lowest place in.
(6) Form—horse-shoe.
(7) Slopes—their degree and comparative lengths.

b. Primary Highlands.

(1) Location.
(2) Number (4).
(3) Names.
(4) Comparative length, width, and height.

NOTE.—Show pictures of portions of primary highlands.

c. Secondary Highlands.

(1) Location.
(2) Number (4).
(3) Names.
(4) Comparative length, width, and height.

NOTE.—Show pictures of portions of secondary highlands.

d. Lowlands—Great Plains.

(1) Location in continents.

(2) Number (4).

(3) Names.

(4) Physical characteristics of each.

(5) Comparative extents.

NOTE.—Show pictures of portions of lowlands. Associate physical, commercial, or historical facts with each.

6. *Drainage.*

NOTE.—Review world ridge. *The continuous mountain chain encircling the land masses of the globe, is called the world ridge.*

a. World water-parting formed by the crest of the world ridge.

b. World-Basins.

(1) Location—formed by ?

(2) Number (2).

(3) Names.—Atlantic and Pacific.

(4) Form.

(5) Comparative extent and depth.

(6) Great plains located in.

c. World River Systems.

NOTE.—Review brook systems,—location of sources (highlands) dependence of direction, length, rapidity of flow, and the final reservoir.

(1) Atlantic Systems.

NOTE.—Children observe here the characteristics of the Atlantic Slope as represented on the physical globe and physical hemisphere map.

Children infer the characteristics of the rivers, find the principal rivers and name them, study pictures of these rivers, and facts of interest concerning them.

Study La Plata river, Amazon, Orinoco, Mississippi, St. Lawrence, Mackenzie, Lena, Yenesei, Obi, Dwina, Rhine, Danube, Nile, and Congo.

(2) Pacific Systems.

NOTE.—Teach in the order named for Atlantic Systems.

Study Colorado, Columbia, Hoang-Ho, Ganges, Indus, Zambezie.

Children observe in the study of rivers that rivers flowing down the same slopes are parallel, and that rivers flowing down adjacent slopes often meet and form a river that flows down the line formed by the meeting of adjacent slopes at their lower edges.

7. *Climate.*

NOTE.—Review climate and recall definition.

a. Zones.

8. *Winds.*

NOTE.—Review wind.

a. Causes.

b. Kinds (variable, periodical, constant).

c. General direction.

d. Different zones characterized by what winds ?

9. *Rainfall.*
   - *a.* Formation of clouds and rain.
   - *b.* Distribution of vapor.
   - *c.* Amount of rainfall.

10. *Ocean currents.*

NOTE.—Study currents with the aid of globes, maps, and blackboard drawings.

- *a.* Location.
- *b.* Direction of flow.
- *c.* Names.
- *d.* Temperature.

11. *Soil—regions of great fertility and of great sterility.*

NOTE.—Children base their inferences upon climate and relief. Children locate great deserts.

12. *Products.*
   - *a.* Agricultural—Wheat, corn, rice, cotton.
   - *b.* Grazing—Meats, fats, hides, wool.
   - *c.* Lumbering—Building materials.
   - *d.* Mining—Coal, iron, copper, silver and gold.

   So far as may be consistent, present products in their raw and in their manufactured state.

13. *People.*
   - *a.* Races—Show pictures.
   - *b.* Distribution.

NOTE.—Show globe or map whose colors represent the distribution of the races.

B SENIOR—EIGHTH GRADE

XXVI. A Continent as a Whole—Use Relief Maps.

A. North America. N. B.—Pupils mold and draw each continent studied.

1. *Position.*
   - *a.* With regard to other continents.
   - *b.* " " " oceans.
   - *c.* " " " hemispheres.
   - *d.* " " " world ridge.
2. *Form.*
   - *a.* Approximate form.
   - *b.* Continental irregularity.
   - *c.* Land projections—peninsulas or capes.
     - (1) Position—from what part of the continent.
     - (2) Adjoining water—arms of what oceans.
   - *d.* Water projections—gulfs or bays.
     - (1) Position—from what part of what oceans.
     - (2) Adjoining lands—what peninsulas or capes.
3. *Islands—Continental.*
   - *a.* Names.
   - *b.* Position.
     - (1) With regard to the continent.
     - (2) In what water.
   - *c.* Formation.

4. *Extent.*
   - *a.* In latitude.
   - *b.* In longitude.
   - *c.* In linear miles—length and breadth.
   - *d.* In square miles—area.

5. *Relief.*
   - *a.* Primary Highlands.
     - (1) Name.
     - (2) Position.
     - (3) Direction.
     - (4) Extent.
     - (5) Ranges.
       - (*a*) Peaks—names, heights.
       - (*b*) Volcanoes—names, heights.
     - (6) Slopes.
       - (*a*) Directions.
       - (*b*) Extent.
     - (7) Valleys.
     - (8) Plateaus.
   - *b.* Secondary Highlands.

NOTE.—See order for Primary Highlands.

   - *c.* Islands.

NOTE.—Relief of islands compared with relief of continent.

   - *d.* Lowlands.
     - (1) Name.
     - (2) Position.
     - (3) Extent.

(4) Physical characteristics.

6. *Drainage.*

a. Great water-partings—crests of what highlands.

b. Great basins—name, position, form, and extent of each.

NOTE.—For the study of individual basins, see XV, 5.

c. Great river systems.

(1) Principal river described.

(2) Principal tributaries described.

d. Lakes.

7. Climate—Temperature, moisture, healthfulness.

a. With regard to zones.

b. " " " seasons.

c. " " " particular localities.

d. " " " prevailing winds.

e. " " " adjacent waters.

8. *Soil.*

a. Kinds.

(1) Origin—glacial, alluvial, diluvial, *in situ*, etc.

(2) Formation—sandy, clayey, loamy, marlaceous, etc.

(3) Fertility.

9. *Natural productions.*

a. Vegetable—physical characteristics of region.

b. Animal— " " " "

c. Mineral— " " " "

10. *People.*
    - *a.* Races.
    - *b.* Distribution.
11. *Countries.— Use political maps.*
    - *a.* Position—in the continent.
    - *b.* Boundary—especially natural.
    - *c.* Extent.
    - *d.* Relief.
    - *e.* Drainage.
    - *f.* Climate.
    - *g.* Soil.
    - *h.* Productions.
    - *i.* People.
        - (1) Dominant race.
        - (2) Leading occupations — manufacturing cities.
        - (3) Leading commercial cities.
        - (4) Leading commercial routes—sea-ports.
        - (5) Government—capital cities.
        - (6) Religion.
        - (7) Education—educational centers.

B. South America—See North America.
C. Europe— " " "
D. Asia— " " "
E Africa— " " "
F. Australia— " " "

A SENIOR—NINTH GRADE

XXVII. A Country—Use relief, political, and historical maps.

NOTE.—The teacher's port-folio and scrap-book will be daily requisites. Personal accounts of travel, the stereopticon, and text-books, must serve when practicable.

1. *Name.*
   a. Derivation.
2. *Position.*
   a. Continental, peninsular, or insular.
   b. Latitudinal and longitudinal.
3. *Boundaries.*
   a. Natural.
   b. Political.
4. *Extent.*
   a. Length,
   b. Breadth,
   c. Area.
5. *Relief.*
   a. Mountains,
      (1) systems,
      (2) ranges,
      (3) peaks—volcanoes.
   b. Plateaus,

(1) extent,
(2) character.

c. Plains,
(1) extent,
(2) character.

d. Valleys,
(1) extent,
(2) character.

6. *Drainage.*

a. Rivers,
(1) general direction of flow,
(2) characteristics,
(3) tidal or tideless,
(4) deltafication,
(5) navigability,
(*a*) distance,
(*b*) time.

b. Lakes,
(1) outlets,
(2) inlets,
(3) navigability.

7. *Coast.*

a. Length.
b. Indentations—harbors.
c. Kind—material, height.

8. *Rainfall.*

a. Frequency.

b. Amount.

c. Causes.

9. *Climate.*

a. Temperature—causes ? effects ?

b. Moisture—causes ? effects ?

c. Healthfulness.

10. *Soil.*

a. Origin—glacial, alluvial, diluvial, eolian, *in situ.*

b. Kind—sandy, gravelly, clayey, loamy, etc.

c. Fertility.

11. *Productions.*

a. Mineral.

b. Vegetable—cultivated, forest.

c. Animal—domestic, wild.

d. Manufactured.

12. *Inhabitants.*

a. Number.

b. Race.

c. Origin.

d. Language.

e. Characteristics,

(1) physical,

(2) social.

f. Industries.

13. *Imports.*

a. Kinds.

b. Amount.

c. From whom.

14. *Exports.*
    a. Kinds.
    b. Amount.
    c. To whom.
15. *Means of transportation.*
    a. Land routes.
    b. Water routes.
16. *Government.*
    a. Kind.
    b. Chief executive,
        (1) term of office,
        (2) salary.
    c. Revenue.
17. *Political subdivisions.*
18. *Cities.*
    a. Capital.
    b. Metropolitical.
    c. Sea-port.
    d. Manufacturing.
    e. Population of.
19. *Religion.*
20. *Education.*
    a. Institutions,
        (1) kinds,
        (2) location.
21. History.

LESSON PLANS AND CRITICISMS

Practice teachers meet weekly by grades, to discuss their work. The topics of discussion are,—

a. Logical arrangement of subject matter.

b. Illustrative material.

c. Presentation of lesson.

d. Reviews.

These plans are then written and submitted to the critic teacher.

A few of them are given here as illustrations.

Occasionally a lesson is given by one teacher, and criticised by the others, who write their criticisms and then submit them to the critic teacher for his judgment. To illustrate this feature of the work a single criticism by a practice teacher is added.

LESSON PLANS—See XXIV, 5

Monday

Teacher take class to cupola of Normal building and point to highest portions of land in view, and lead children to state that these are ridges of land.

Pupils determine cardinal points from the cupola.

After pupils have determined the cardinal points have them locate the direction of some one ridge, say the one extending south from the Fair Ground.

Pupils observe that many ridges may be seen from the cupola, and that all do not extend in the same direction, but that the greater number extend from north to south or nearly so.

Pupils estimate the length of the ridge considered, also its height.

Its length and height compared with other ridges that may be seen.

Pupils observe that the highest portion of the ridge forms an irregular line which may be readily seen against the sky or the ridge beyond the one studied, and state that this line is called the crest of the ridge.

By questioning, teacher get from pupils that the sides of this ridge from the crest down to its lowest portion are called the slopes; that the slopes of this particular

ridge are gradual; that the slopes are of unequal lengths; that the shorter slope is the steeper, and the longer slope more gradual.

Tuesday

Oral reproduction of what was taught Monday.

Pictures of ridges shown.

Ridge making on sand-board.

Review of terms *ridge, crest, slopes,* etc.

Wednesday

Pupils taken to cupola of normal building to observe that as the snow on the several ridges melts and forms water, it flows in different directions; that snow melting on adjacent slopes, *e. g.* the east side of the ridge studied and the west side of the ridge on which the asylum is situated, flows down and comes together, and then flows in a direction nearly parallel to the long crests, into the lake; that all the land included between these crests, whose waters unite and flow into the lake, is called a basin; and that as the snow melts on the ridge studied, a portion of the water flows in one direction, and another portion in a second direction; that there is a line on the highest parts of the ridge which corresponds to the crest, where the water parts and flows in opposite directions, and this line is called the water-parting; that its shape is irregular like that of the crest.

Pupils questioned as to the shape, extent, and lowest portion of the basin.

Thursday

Oral reproduction of Wednesday's lesson.

Pictures of basins shown.

Basin making on sand-board.

Review of terms *water-parting, basin, extent of basin,* etc.

Friday

Lead pupils to observe and state that ridges vary in height and length ; that the highest and longest mountain chains are but the largest ridges of the world.

Teacher present relief globe or map.

Pupils point out what represents the ridges (mountains) on globe or map.

Pupils point to longest ridge in South America.

When pupil has done this, direct him to begin at the most southern point of this ridge and trace it north.

Lead pupils to see and state that this ridge extends to Bering strait ; that it continues under the surface of the water to the eastern coast of Asia ; thence south west to the Himalayas ; from the western extremity of the Himalayas to Arabia ; across the Isthmus of Suez to Eastern Africa ; and along the eastern coast of Africa south to Cape of Good Hope.

Pupils led to see that this ridge almost encircles the world, on account of which it is called *the World Ridge.*

Pupils led to observe the slopes of the World Ridge, their comparative lengths, and state that the shorter slope is nearest the largest ocean. Observations and statements similar on the longer slope.

Pupils led to observe and state where the highest and where the lowest points of the World Ridge are.

SMITH MURPHY,
Practice Teacher.

CRITICISM ON GEOGRAPHY LESSON

SEE LESSON PLANS—Monday

I. Report of Lesson

The teacher first removed from the board all matter foreign to the subject, and placed the illustrative material ready for use.

The lesson was a reproduction of the field lesson of the preceding day. The teacher recalled the things which the children had seen, and developed and wrote upon the board the definitions of ridge, crest and slope.

One statement in which the work "ridge" was used in defining "ridge", was accepted as a good definition.

Incorrect expressions of the children were sometimes but not always corrected.

The teacher asked for full sentences, and accepted broken ones, or disconnected words.

The teacher did not insist that the children should stand to recite.

The teacher worked for words, saying, "Now, Mary, you say it."

The teacher tried to keep the children busy while writing upon the board, by asking for the next

word, or by having them spell the words, but she did not write rapidly enough.

The teacher confined her questions as a rule to a few, because she was not familiar with the names of all. Her knowledge of the names was used to good advantage.

Pictures were shown, and the order was remarkably good. These pictures were shown while one child was working upon a sand map, and thus the others were kept busy.

Individual recitation of the matter was begun, but the summary was not finished from lack of time.

II. Method—analytic and synthetic.

III. Subjective Technique

1. The room was in good condition in regard to temperature, ventilation, and neatness. *Good.*
2. The apparatus was in good condition—all matter foreign to the lesson being removed from the board. *Good.*
3. The illustrative material was in order, and where it could easily be obtained when needed. *Good.*
4. The children seemed ready for work, and the teacher's attitude was such as to make them wish to tell what they knew concerning the preceding day's work. *Good.*
5. The teacher seemed at ease, and knew what she

was to teach. Her position and manner toward the children were good. *Good.*

6. The teacher did not insist that the children should stand to recite. *Not good.*

IV. Objective Technique

1. Object—To cultivate perception, memory, and apperception.
2. Point—To develop ideas of, and give terms, *ridge, crest,* and *slope.*
3. Plan.

Preparation:

The field lesson of the preceding day was recalled and interest awakened. *Good.*

Development.

The development was logical and to the point. *Good.*

Incorrect expressions were not always corrected. *Not good.*

Broken sentences and disconnected words were accepted instead of full statements. *Not good.*

Teacher worked for words. *Not good.*

Teacher did not write on board rapidly enough. *Not good.*

Too few were questioned. *Not good.*

Summary—

Not completed.

4. Matter.

A line of hills is called a *ridge.*

The irregular line which the top of the ridge forms against the sky is called the *crest.*

The sides of the ridge are called *slopes.*

5. The illustrative material consisted of pictures and the sand board. The pictures were shown, and helped some *but not all* to get a better idea of ridge, crest, and slope. *Not good.*

6. The recitation was individual. *Good.*

7. The questioning was logical and to the point. *Good.*

The teacher often worked for words instead of for thought. *Not good.*

V. Statistics

Pupils present—14.

Number interrogated—9.

Number interrogated more than once—4.

VI. Results in regard to

Instruction.

Object—work favorable to its being gained. *Good.*

Point gained. *Good.*

Language not cultivated. *Not good.*

Intercourse.

Relations between teacher and pupil. *Good.*

Relations among pupils. *Good.*

Discipline and government—not necessary.

VII. Judgment—favorable.

Good	*Not Good*
Room,	Positions of pupils,
Apparatus,	Language,
Illustrative material,	Working for words,
Children,	Slow board work,
Teacher,	Too few questioned,
Preparation,	Pictures.
Recitation,	
Questioning,	
Instruction,	
Intercourse.	

HELEN E. JONES,
Practice Teacher.

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ANALYTICAL INDEX

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